Great Lakes Restoration Initiative

NOAA Climate Projects

"Climate change is real. It is here, and it is happening now, in our backyards and around the globe."

Jane Lubchenco, Ph.D.
Under Secretary of Commerce for Oceans and Atmosphere
Administrator, National Oceanic and Atmospheric Administration

Climate Change in the Great Lakes Region

As global climate change occurs, the Great Lakes region is predicted to experience different, but no less significant, impacts than ocean coasts. Changes in lake water levels may affect regional water supplies, increase lakeshore erosion, and support more invasive species. Warmer temperatures will likely reduce the extent and duration of ice cover, lengthen periods of lake stratification, and elevate the risk of hypoxia and algal blooms.

Restoring the Great Lakes will enhance ecosystem resiliency and help buffer the impacts of climate change, particularly for the Great Lakes' 158 coastal counties. The fact remains, however, that the region's resource managers, policymakers, and citizens must proactively plan for a changing climate and changing lakes.

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Recognizing the importance of the Great Lakes to our nation, President Obama made their restoration a national priority. The resulting Great Lakes Restoration Initiative (GLRI) is the largest investment in the Great Lakes in two decades. The GLRI Action Plan identifies five issues requiring urgent action: Toxics and Areas of Concern; Invasive Species; Nearshore Health and Nonpoint Source Pollution; Habitat and Wildlife Protection and Restoration; and Monitoring, Communication, and Partnerships. A task force of 16 federal agencies has been charged with implementing initiatives to address these focus areas over a five-year period (FY 2010-2014).

NOAA's Role in Climate Initiatives

Support from the Great Lakes Restoration Initiative (GLRI) has helped NOAA become a leader in climate change research, outreach, and education in the Great Lakes. NOAA's Climate Projects use a three-pronged approach to research climate change and promote adaptation and resiliency plans for the Great Lakes region:

- Collecting baseline data about Great Lakes climate conditions ensures that long-term trends can be monitored, and better decisions made as a result.
- Monitoring and modeling climate variables to project future climate trends allows for more effective planning. For example, a new three-dimensional air and water model yields precise simulations of possible climate change scenarios.
- Educating Great Lakes decision-makers, stakeholders, and citizens about climate change adaptation and resiliency allows communities to make informed decisions about the future. Effective planning will help safeguard against losses and damages to coastal properties and facilities, protect water resources and quality, and preserve fisheries and Great Lakes-dependent economies.

In combination, GLRI-supported projects make critical contributions to climate change knowledge and action in our region. Of vital importance, they address not only the physical and biological science of climate change in our region, but the social science as well.

Collaborative Efforts

Regional partnerships are vital to encouraging adaptation and planning throughout the Great Lakes region.Toward this end, NOAA has fostered a broad and ever-expanding network of government and nonprofit collaborators. Over 30 partners have been involved in NOAA's Climate Project initiatives to date. Partners represent a diverse group of interests: federal, state, and local governments; community, city, and county planning organizations; nonprofit agencies; professional and industry associations; regional climate centers; native tribes and elder councils; research institutions; and tourism associations, among others. The common objective of responding to and preparing for climate change in the Great Lakes region draws these stakeholders together.

Credit: R. Greaves

ACCOMPLISHMENTS

Thanks in part to GLRI funding, NOAA employees and partners have carried out several initiatives to improve climate change knowledge and resiliency in the Great Lakes:

FY 2010

- Performed long-term climate simulations using the Coupled Hydrosphere-Atmosphere Research Model (CHARM). CHARM climate simulations address issues such as Great Lakes ice formation and runoff into the lakes.
- Conducted "Planning for Climate Impacts" and "Coastal Planning" Workshops in five key Great Lakes cities.
- Conducted a basin-wide elevation data inventory and filled critical nearshore bathymetric data gaps in Lake Superior (~900 linear kilometers of data collected in priority areas).

FY 2011

- Produced an Interactive Great Lakes Water Level Dashboard that allows individuals and communities to view past, current, and predicted future lake water levels.
- Published a series of articles about temporal and spatial variability of Great Lakes ice cover using almost 40 years of satellite measurements.
- Collaborated with the Association of State Floodplain Managers to create an interactive guide to provide coastal communities with the tools, training, and information necessary to plan for coastal hazards.
- Partnered with Sea Grant offices and academic experts to enhance climate literacy programs and build outreach capacity to support long-term climate literacy efforts in the Great Lakes region.

"[Climate change] is a priority. Things are going to change, and we've got to get beyond what the cause is and think about some solutions at the local level."

Great Lakes Watershed Planner

Initiative Highlight

Project name: "Planning for Climate Impacts" and "Coastal Planning" Workshops

Location: Chicago, IL; Cleveland, OH; Duluth, MN; and Green Bay and Milwaukee, WI

Description: GLRI funds enabled NOAA and key partners to design and implement climate change adaptation and coastal planning workshops in five Great Lakes cities. Workshops took place in 2011, and follow-up consultation and technical support are ongoing. Thanks to collaboration with local partners, workshops were specifically adapted to local circumstances, priorities, and needs.

Key partners: Environmental Protection Agency, National Estuarine Research Reserve System, Great Lakes Sea Grant Network, University of Wisconsin-Extension, Ohio Coastal Management Program, Wisconsin Coastal Management Program, Minnesota Coastal Management Program, City of Milwaukee, and Chicago Metropolitan Agency for Planning.

Results and accomplishments: Five workshops trained over 240 natural resource managers, community and resource planners, public health professionals, industry representatives, emergency responders, and administrators. Workshops offered training in:

- The impacts of climate change;
- Information, tools, and resources that foster understanding of regional vulnerabilities to climate change impacts, and steps that can be taken to address these risks;
- Techniques to engage community members and build political support to plan for climate change impacts; and
- Adaptation planning efforts at various regional levels, and their implications for local planning efforts.

NOAA and partner agencies continue to work with partner communities. Recent surveys show that climate and coastal planning information is being shared throughout the fifty-plus federal, state, local, and non-governmental institutions that sent representatives to the workshops. This has a tremendous influence on the capacity of individuals and organizations to make informed planning decisions about Great Lakes water and coastal resources, climate adaptation, and public health and safety.

The overwhelmingly positive participant response has led NOAA to customize trainings for specific positions (e.g., water resource managers) to hone the expertise that professionals can bring to their work and communities. In addition, NOAA has collaborated with regional and local partners to develop web-based trainings for those who are unable to attend an in-person seminar. Monthly webinars address a multitude of issues that reach across the biological, environmental, and social sciences and encourage multidisciplinary thinking about, and approaches to, climate change.